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Engineering

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OFFICIAL PROCEEDINGS
Meeting of March, 1918.

Volume XVII.
No. - - - 3

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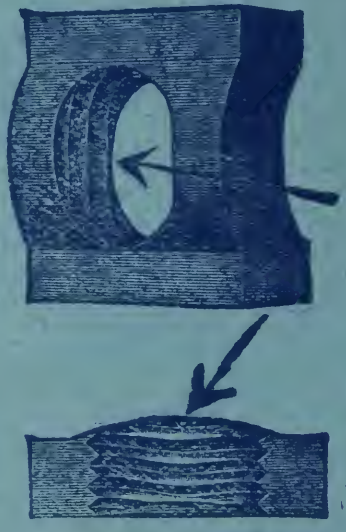

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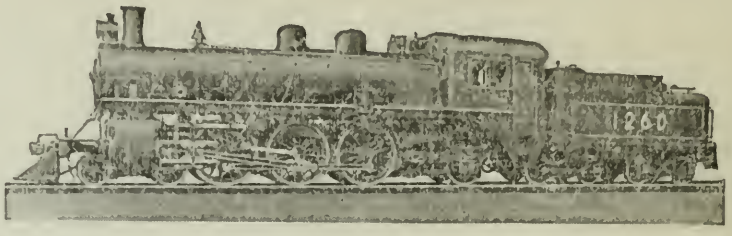

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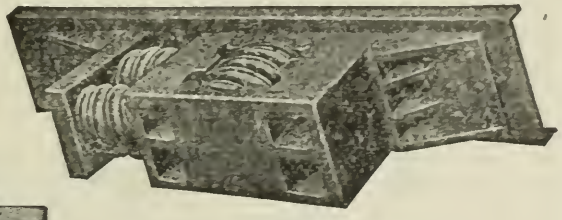

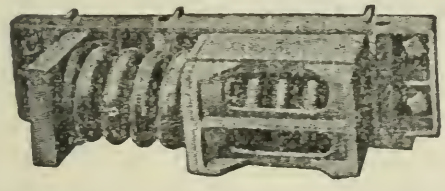

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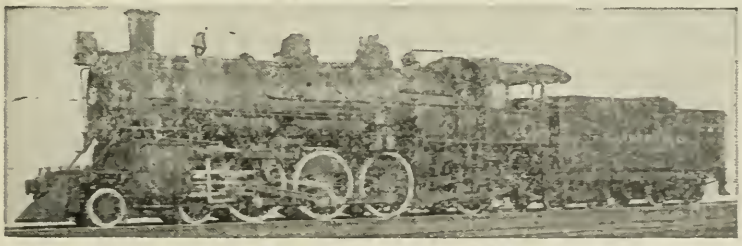

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PROCEEDINGS OF THE CANADIAN RAILWAY CLUB.

Windsor Hotel, Montreal,
March 12, 1918.

Chairman:

Gentlemen, come to order please. I am sorry to have to announce that I shall be unable to stay the entire evening, as I must be in Ottawa to-morrow morning at 10 o'clock, and will therefore have to leave about 10 p.m. I will ask Mr. Hudson, 2nd Vice-President of the Club, to take my place in the chair. The Secretary requests that you fill out the cards which are on the chairs. Please do this, as it is important that we have a record of the attendance.

The second order of business is reading of the minutes of previous meeting. These have been printed and are being sent to the members. There are also one or two copies here on the table which any member may have in case he desires to send one to his friends.

We have not been able to use the Ladies' Ordinary Dining Room for our meeting to-night, as that room has been assigned to other parties, but we hope at our next meeting to have the use of this room again.

In connection with the subject of the paper for our next meeting, April 9th, this paper is on "Freight Brake Maintenance," and the author is Mr. F. B. Farmer, Representative of the Westinghouse Air Brake Company at St. Paul, Minn. I understand that prior to entering the employ of the Westinghouse Company Mr. Farmer had a large railroad experience, and in his present line of work has few equals for thoroughness and interest in questions that are vital to the users of power brakes.

Coming as he does from a section of the country where the climatic conditions are similar to our own, I feel certain that Mr. Farmer will have a message for us that will be of interest, not only to members who are responsible for the safe and quick movement of trains, but also those of us whose activities are directed along other lines.

In view of the importance of Mr. Farmer's subject and the distance he will have to travel to attend our meeting, I hope there will be a very large attendance on that occasion.

Gentlemen, I am sure that some of our members here know

of Mr. Farmer and that we shall have a very instructive paper. He has had a large experience in the air brake and is well qualified to instruct us in the operation of brakes, which question is especially important during the winter time. I would ask the members present to mention to other members who only occasionally attend our meetings and encourage them to come to the next meeting. I am sure we shall listen to a treat.

The next order of business is the announcement of new members. I will ask the Secretary to read the list.

Secretary:

The following applications have been passed upon by the Executive Committee:

New Members.

Casey, J. F., Engineer, Taylor & Arnold, 507 Bank of Toronto Bldg., Montreal.

Desparois, D., Asst, Pass. Shop Foreman, Can. Pac. Rly., Anngus Shops, 2557 Esplanade St., Montreal.

Diplock, H. S., Sales Manager, Steel Co. of Canada, Ltd., Montreal.

Dunlop, W., Travelling Boiler Inspector, Grand Trunk Rly., 46 Victoria Ave., St. Lambert, P.Q.

Evans, W. E., Accountant, Purchasing Department, Grand Trunk Rly., Montreal.

Graves, W. M., Inspector, Vapor Car Heating Company, 61 Dalhousie St., Montreal.

Hannah, W. D., Fuel Inspector, Grand Trunk Rly., Montreal.

Harriman, S. P., Canadian Agent, Vapor Car Heating Co., 61 Dalhousie St., Montreal.

Harrison, F. D., Night Locomotive Foreman, Grand Trunk Rly., 129 LaCasse St., St. Henri.

Hickman, F. C., Supr. M. P. Piece Work, Canadian Pacific Rly., 1994 Cartier St., Montreal.

A. Holden, Salesman, O. W. Meissner Company, 2426 Park Ave., Montreal.

James, H. H., Draughtsman, Montreal Locomotive Works, Montreal.

Letourneau, G. E. A., Canadian Gold Car H. & L. Co., 346 St. James St., Montreal.

McCuaig, J. D., Loco. Foreman, Grand Trunk Rly., Turcot.

Spence, J. M., Locomotive Engineer, Grand Trunk Rly., 60 Prudhomme Ave., Montreal.

Chairman:

You have heard the names of the proposed new members, which have already been passed upon by the Executive Committee. It will be in order to move their acceptance.

Mr. R. M. Hannaford:

I move their acceptance.

Mr. P. E. Berube:

I second that.

Chairman:

Moved by Mr. Hannaford, seconded by Mr. Berube, that these names be accepted.

Carried.

MEMBERS PRESENT.

G. E. Smart
W. H. Bannerman
E. R. Battley
F. Benger
S. Blumenthal
L. A. Boucher
H. Brown
J. W. Buckland
E. W. Burns
A. J. Candlin
M. E. Casey
T. C. Chown
R. C. Cookman
C. H. N. Connell
E. A. Cunningham
C. R. Curry
A. G. Dawe
G. W. Dunn
J. M. Eakins
J. F. Faber
W. Forrest
W. Gillespie
R. M. Hannaford
W. J. Hatch
J. Hendry
N. Holland
W. B. Hood
T. C. Hudson
W. C. Hunter
H. H. James
G. E. Johnson
G. E. Kell
W. G. Krauser
E. E. Lloyd
G. T. Merwin
M. J. Miller
A. E. Mimms
J. McCarthy
J. D. McCuaig
A. McDonald
E. S. McMillan
E. J. McVeigh
W. P. McVey
D. B. Williams
W. A. Newman
L. G. Nicholson
E. A. Nix
K. F. Nystrom
J. E. Palme
H. Pearce
W. Prowse
H. Rake
G. W. Robb
W. H. Robb
F. M. Rollo
D. Ross
T. Sleigh
R. Snook
W. Spence
H. B. Stuart
T. A. Summerskill
H. P. Swinton
J. Talbot
C. Tinkler
W. H. Winterrowd
Jac. Powell
and others

Chairman:

The next item is unfinished business. I will ask Mr. Norman Holland to advise the Club the results of the "Smaker" held last month.

Mr. N. Holland:

Mr. President and members, those of you who were at the "Smoker" I am sure enjoyed yourselves. You noticed how the Secretary enjoyed himself with the young ladies. The only fault was that I would not take him away with me when taking them home. The receipts were $304.00. The expenses will be approximately $100.00, giving $200.00 as a net profit, which, I think, you will admit is a pretty good result. A committee has been appointed to look into the best method of distributing these funds. The idea is that they shall be used either to assist the members of our Club who have returned from the front or for the families of those who have unfortunately been killed. The report of this committee will be given later.

Chairman:

I might say that in addition to the $304.00 subscribed there was something like $64.00 additional given to the "Gazette" Tobacco Fund.

In the matter of unfinished discussion at previous meeting, is there any member who would like to say anything on that? If not, we will now have the paper of the evening, by Mr. E. R. Battley, Master Mechanic of the Grand Trunk Railway at Montreal, on "Locomotive Repairs." I have not yet had an opportunity to read this paper, but from the heading it appeals to me as one which will bring out a good discussion. I will ask Mr. Battley to come forward and read it. I will probably have something to say on it later on.

Mr. E. R. Battley:

I have always prided myself on being a first class listener, but never expected to come forward and read a paper or have a great deal to say, but since coming before you to-night I think I could offer a suggestion. We provide comfortable seating accommodation for the listeners, but the speaker or the man who needs the support is obliged to stand up: however, I will endeavor to read through according to the old custom.

"LOCOMOTIVE REPAIRS."

By Mr. E. R. Battley, Master Mechanic, Grand Trunk Railway, Montreal.

(*To be read before the Canadian Railway Club, March 12th, 1918.*)

Repairing and maintaining running repairs on locomotives are two of the great problems with which railroads have to

deal. On account of the abnormal conditions and the vast amount of freight waiting to be moved, it is essential that railroads keep their engines in constant service, which means a special effort must be made by shop forces to complete repair work as quickly as possible.

Due to the demand for locomotives in the Allied countries our locomotive builders cannot supply sufficient new engines for export and for home use, therefore it has been deemed advisable to ship a large part of the output abroad, using our present power to its capacity. By so doing we must expect the outlay for repairs will be in excess of that of former years. The wages paid to-day are high, and in the majority of repair shops, railroads are forced to employ mechanics inexperienced in regard to railroad work, which necessarily follows repairs take longer and the work requires closer supervision.

The past few years the Government has exercised considerable authority over the railroads in regard to the building and maintenance of power, setting down certain rules and regulations concerning standards, defects, etc., and have assigned inspectors to certain districts to see that rules are observed. While these laws added considerable extra work to most roads it has, no doubt, been the means of improving the power and prolonging the life as well.

As previously stated one of the great trials of all railroads is to keep up the repairs on their motive power. To accomplish this we must provide proper facilities for repairing and handling, at roundhouses and general repair shops.

Roundhouses.

It is difficult to do quick work at terminals unless we provide proper facilities, such as suitable roundhouses and equipment. The key to the power handling situation of the roundhouses is the ashpit, therefore we must provide large pits equipped with a sure and quick means of handling the accumulation of cinders. Ample room must be provided on both sides of the pit so that in rush hours fires can be cleaned or dumped and engines moved along out of the the way to await their turn on the turntable. If this space is not provided, and after an engine or two has been dumped, it means the work on the engines following is at a standstill until those ahead have been moved. Conditions of this kind causes ashpit gangs to be idle and at a busy terminal a large waiting list is the result.

In close relation to the ashpit is the turntable and shop

leads. The former should be of rigid construction and power operated. The leads should be of sufficient length to accommodate outgoing engines and provided with suitable crossovers and water-cranes to facilitate the despatching of power.

A valuable addition to any roundhouse is good machinery. A great mistake sometimes made by railroads is filling up roundhouse machine shops with antiquated tools. When a machine job is required in a back shop it is usually a rush order, therefore speed and accuracy is required. If modern tools are used you get what is desired without delay. All our terminals of importance have been equipped with portable oxy-acetylene welding and cutting outfits, and needless to say they have proved invaluable.

Organization is another valuable asset to the shop. One may have a splendid layout, good tools, etc., but without system efficiency is reduced. We have found by arranging our roundhouse staff in special gangs good results have been obtained. These gangs are grouped as follows: passenger, freight and switch, air-brake, spring and brake-gear, rod and box packing, lighting up, and, last but not least, the boiler gang. The different gangs are controlled by chargemen, who report to the shop foreman.

Engineers upon arrival book the necessary work in a book provided for the purpose. A competent inspector also makes an examination of the engine and records defects found. The work is then copied by a man assigned to this work, who distributes the slips to the respective charge hands. When the work is completed a notation is made in the report book on the opposite page to the one in which the engineer placed his report.

In dealing with roundhouses I might mention an important item that contributes to shop efficiency, but which is sometimes treated lightly, and that is, cleanliness. We have found by experience that in keeping our premises clean and tidy better work is produced and time saved, as spare material can be quickly located. Accidents due to employees falling over old material are reduced to a minimum. In addition to these beneficial results it looks well and gives one the impression that the foreman in charge is "master of the situation."

During the busy season, when locomotives are at a premium, the cripples at roundhouses accumulate quickly, unless a close check is kept on the shipment of repair parts. We have a system of checking up and forwarding repair parts to out stations that has proved very satisfactory, and has been the means of keeping our locomotives in service during the

past severe winter. Foremen at each station send a joint message to the Road and Shop Master Mechanics as soon as he finds he requires repair parts. In addition to this he sends in a daily report of engines undergoing repairs which will take over 24 hours, stating when engine was taken out of service, what material is required and on whom ordered. This gives the master mechanic an excellent opportunity of keeping in close touch with the situation on his division. To ensure requisitions being filled promptly and to avoid delays in shipment or at transfer points a material man was appointed by the road master mechanic. His duties are to check requisitions, receive telegrams for material, consult shop master mechanics and subordinates as to when material can be secured, see that there is no delay in handling, also advise out stations on what train material is going forward so that he can be prepared to have it removed promptly on arrival.

General Repair Shops.

General repair shops should be of sufficient size to care for the power assigned to the division and centrally located.

When an engine is to be shopped and the nature of repairs is mainly controlled by the road master mechanic. Any unusual repairs decided upon after a boiler inspection and hydrostatic test has been applied. After the engine has been stripped the shop inspector makes out a final report and repairs are made accordingly. Accompanying each engine to the shop is the Locomotive Foreman's report of repairs which forms the basis from which shop Master Mechanic works.

There is approximately 10% of our power under repairs at all times, this is necessary to keep our engines in good condition, and also provides sufficient work in advance for the shop staff, who work entirely on the bonus system. Our output and bonus system are so closely related that in speaking of one it is necessary to mention the other. The subject tonight being repairs, the bonus system will only be mentioned when necessary to show why we handle certain operations in certain ways.

Our methods are practically the same over the entire system, but as Stratford shop was the first to try this system we will use it as an illustration.

The repairs required are designated by a certain letter which is in itself a symbol and indicates what kind of repairs are necessary. Also approximately how many days engine

will be in the shop. If you will refer to the following you will find the letters used with a brief explanation:

B.S.—Boiler to be converted to superheat and will be 24 working days in the shop. (Spare boiler and cylinders are ready before engine comes in.)
B. —New firebox to be applied. 21 working days allowed.
C. —Firebox will receive new half side and possibly new flue sheet. 21 working days will be allowed.
D. —Boiler is to be retubed and machinery given a general repair. 18 working days allowed.
D.C.—Same as D except new cylinder or cylinders will be applied. 21 working days will be allowed.
E. —Wheels removed, tires turned, boxes and rods repaired. 12 working days allowed.
L. —Light repairs, such as replacing broken rods, light patch in firebox, or any work which roundhouse cannot conveniently handle.
S. —Specific repairs. Some special job which is really roundhouse work, but for some legitimate reason is handled in the main shop.

As each kind of repair is allowed a certain number of days in the shop, the list of engines turned out weekly has to bear a certain relationship to this, in order that output may be regular, both as to quantity and weight of repairs.

The foremen meet in the Master Mechanic's office each Friday and incoming engines are assigned to their proper places on the outgoing list. A new list is issued each week.

The engines are booked in, in such a manner that each week's output will represent about the same weight of repairs on the whole, although the number of engines may be more or less.

As time is limited I cannot describe the methods as applied in all departments, but would take it for granted the various parts have been repaired and are now in the erecting shop. This department was formerly handled with nine regular gangs, consisting of approximately ten men per gang, controlled by a chargehand who was responsible for three pits. In addition to the nine gangs we had three or four special gangs, such as shoe and wedge, guide bar, and steampipe. Our regular pit gangs carried the engine through from the time the engine was stripped, with the exception of the detailed work above mentioned. Under this system we accomplished good work until our forces became depleted through enlistments,

and upon looking carefully into the situation we found where a gang usually had five or six mechanics it would probably have one or two, the remainder being unskilled help. It was, therefore, necessary for us to meet the new conditions in order to keep up the repairs. To do this we re-arranged our men into special gangs, mainly to centralize our machinists on work that really required mechanics, and use the unskilled labor on the coarser work. With this arrangement instead of a gang having three pits on which to work they have the entire erecting shop, therefore delays were reduced to a minimum. The gangs were arranged as follows:

Stripping Gang.

Strip engine complete, with the exception of mountings and pipes. These are taken off by the strippers of the steam-pipe department.

Frame Gang.

Main frame applied and rebolted, front frames applying and rebolting complete (when cylinders are not off) back and front deck castings, waste sheet and cross-tie casting. Furnace bearers back, front or side renewed or bolted, furnace bearer brackets on frame, friction casting and wedge, lining up boiler when engine is rebuilt when the original cylinders are used, steel running boards and brackets with all necessary studs.

Shoe and Wedge Gang.

Line up, mark off, machine and fit up all shoes and wedges.

Guide Bar Gang.

Set all guides, face all valve seats, apply steam chests and bore cylinders in erecting shop.

Brake and Spring Gear Gang.

All brake and spring gear complete, fitting up and applying, including brake hangers, brackets, etc.

Motion Gang.

Pistons, motion plate and motion plate knees, piston valves, cylinder covers and studs for same, rocker boxes, tumbling shaft and brackets, transmission bars, links, etc., eccentrics, valve rods and other necessary motion work.

Front End Gang.

Buffer beams complete, draw casting, coupler and connections, hand railings and columns for same.

Steam Pipe Gang.

Stripping the mountings and pipes from engines, repair and grind throttles, steam pipes, headers and units, and apply same complete.

Trimming Gang.

Air pump and other air-brake work, inspirators and all small jobs.

Cylinder Gang.

Apply all new cylinders.

The foregoing covers practically all operations in the erecting shop. Other work, such as carpentering, tinsmithing and painting is done by the respective departments.

In passing, I would like to touch upon one special feature of our bonus system, which is the key to the success of that system; that is, the demonstrating end of the bonus department. The prices set by demonstration when possible are known to be fair and correct. The chief demonstrator and his assistants have charge of this work over the entire system, and travel continuously from shop to shop. These men do not worry a great deal about prices, as this has been efficiently handled by the bonus department of each shop, which sets the prices according to the peculiar conditions surrounding the different plants, but being our most expert men they concentrate their efforts in bringing each department in all shops to a higher state of efficiency by transferring best methods, and, if necessary, men from one shop to another. As a result of this method workmen are free from the worry of price cutting, therefore the standard of work has shown a steady improvement. This department also controls the method of applying the bonus system, with the result that the method of application is the same at all shops. It is needless to say the results obtained from his sysem have been highly satisfactory, and in spite of the unfavorable labor conditions, we have maintained repairs on our locomotives, and in addition to keeping up the ordinary repairs we have been able to convert 57 engines from saturated to superheated steam.

Chairman:

Unfortunately I am not in a position to discuss this paper in detail, but I know there are members here who are eager to say a few words on the subject. I remember at one of our meetings we had the question of fuel under discussion and the

burning of cinders from locomotives. I do not know why they need these ashpits so nicely arranged when they are going to use pulverized fuel—or some other means of disposing of the ashes. In regard to percentage of engines under repairs; in the Car Department we have "cripples," but we would be severely criticized by the management if we had anything like 100% under repairs. If we get up to 5% we are high. We try to keep it at about 3%. Heavy repairs to locomotives, on Canadian Government Railways, are handled on a mileage basis, the engine receiving certain repairs based on mileage made in freight or passenger service. Possibly Mr. Battley will have something to say on the question of locomotive repairs based on the average mileage they give.

Mr. E. R. Battley:

We do not follow that system at the present time. We give an engine a general repair when required. We have no set mileage for shopping the engine.

Chairman:

Some of the locomotive men here will, no doubt, take that question us as the time limit is not the proper method of setting the date for repairs. The engine might be standing around the same as a car and repairs may be needed only when parts are worn out. Gentlemen, the paper is open for discussion. Mr. Winterrowd?

Mr. W. H. Winterrowd:

Mr. President, I would prefer that someone else open the discussion. As far as I am concerned, and I am sure as far as all Motive Power men are concerned, the question of locomotive repairs has been an extremely vital one, especially during the last few months in which we have experienced unprecedented weather and traffic conditions, both coupled with the shortage of skilled labor.

The points mentioned in the paper are all well taken, but I would like to see the discussion follow the trend of engine maintenance in roundhouses.

The chief problems that the Motive Power men face to-day are men, organization and machinery. We all know the difficulties we have had in obtaining skilled mechanics, and the problems we have had to contend with in taking that class of men and making mechanics out of them, have been anything but simple. It used to be possible for an Enginehouse Foreman to instruct his men to perform certain work. This can-

not be done to-day. Conditions are such that the Foreman is compelled to direct almost every movement of unskilled labor, and I would like to hear some of the gentlemen present tell us what they have done to maintain their organization in the machine shops and engine houses.

With reference to machinery—it is well to ask ourselves if we are getting the most out of every machine. It is highly important and a great help if every machine is worked to full capacity systematically. Is material being routed through the shops so that it will have work performed upon it in the shortest space of time? Is any unnecessary work being done on these parts? There are a great many parts of a locomotive which could receive rough finish and do their work equally well. In large shops, it is highly important that material keep moving in the proper direction and moving quickly.

At the Angus Shops of the Canadian Pacific Railway, the electric storage battery trucks have been a very important factor, and material is moved in and out of the stores and through the various shops in a minimum time and with minimum labor. It is also highly important that the organization to maintain the output of locomotives and cars be kept intact, and to accomplish this is really one of the biggest problems the Motive Power man has to contend with to-day.

Mr. T. C. Hudson:

Mr. Chairman, I would have preferred to listen to some of the younger members to discuss the paper to-night.

The question of mileage of locomotives between shoppings is one which has bothered officers of mechanical departments and others for a number of years. I do not know that a solution has been found yet. It is difficult to arrive at just what mileage locomotives should make between shoppings, as the conditions under which they operate vary so much. The size of wheels should be considered and the conditions known as to grades, curvatures, etc. A small wheeled engine in heavy freight service has a tendency to wear tyres down quickly, and sometimes it is impossible to get more than 35,000 or 40,000 miles between shoppings. On the other hand it has been found possible to get more than double this mileage from a large wheeled engine in through freight or passenger service. Regarding the percentage of engines under repairs, compared to the total. It is necessary before estimating one division against another to show the operating conditions.

On the Canadian Northern, we have got down as low as

6% and 7% in severe weather, with not more than one engine waiting repairs.

In reading a railway journal a short time ago, I noticed a case of one road which came under the United States Government, and in checking up they found that out of a total of 1,100 engines, 300 were "hors de combat," a very high percentage indeed. However, we can always compare a division with its previous performance, making due allowance for the increased cost of labor and material.

Mr. E. R. Battley:

I would like to ask Mr. Winterrowd if the C. P. R. used piston rings without boring on the inside. The suggestion was made some time ago that we use castings as near to size as possible, turning the outside but leaving the inside rough or with the skin on the inside of the ring .

Mr. W. H. Winterrowd:

The amount of finish you put on the ring depends upon the way the ring is made. If you have a fine casting it may not be necessary to do it at all. Our usual practice is to simply rough away a small amount of the rough spots.

Chairman:

Mr. Summerskill?

I do not know that I can say very much, Mr. Chairman. There is one question though, and that is, who applies the ash-pans, smokebox nettings and baffle plates, and so forth?

Mr. E. R. Battley:

That is taken care of by a gang from the boiler shop.

Chairman:

Have we not some locomotive engineers here this evening who can tell us about the engines after they are turned out of the roundhouses or criticize the work done on them?

Mr. W. H. Winterrowd:

I would like to ask Mr. Battley what system of inspection is followed on the Grand Trunk after repairs in the back shop and before the engine is finally turned over for work on the road. Does the Road Foreman or a man from the Operating Department examine the engine or does the engine undergo any trial mileage?

Mr. E. R. Battley.

The engine is tried out by the shop inspector, who is an ex-engineer. The engine makes a trial trip according to the class of repairs received.

Mr. W. H. Winterrowd:

Is the trial trip made on the shop territory or out on the road?

Mr. E. R. Battley:

Usually the engine goes out on the road from one to five miles.

Mr. W. Spence:

Speaking from the engineer's point of view; the engineer is responsible for booking proper repairs, but there is another question as regards to what proper repairs are to the engineer and to the locomotive foreman. It is alright to criticize the locomotive foreman for not getting the repairs done, but before he can do these repairs he has got to get material, and he may be laboring under conditions of which we have no knowledge. Speaking about piston rings; how many of us look at it from the Master Mechanic's point of view? I would like to say that amongst engineers—some of us are under the impression that the locomotive cannot be properly handled with a full boiler of water. My experience has been to run with as low water as you can consistent with safety, but always have enough so that if the inspirators should fail you will have sufficient time to dump the fire. In running with a full boiler of water we do not get good results. It destroys the lubrication, also the piston rings, and the engine will not give a good mileage. You can destroy the rings in a hundred miles if you are not careful of the water. In working in roundhouses we are at a detriment because in the severe weather the houses are full of steam, due to some of the shop staff allowing the engines to blow off and the engineer cannot see to proper advantage to do the work required. I would like to hear from some of our mechanical experts here about these things.

Chairman:

Mr. Gillespie—have you anything to say on the subject?

Mr. Gillespie:

It is hardly fair to call on me to say much on this question as I am like yourself, my experience has been mostly in the car

line, but I have listened with a great deal of interest to the paper that has been read by Mr. Battley, and while he has taken a great deal of pains in compiling this paper covering shop planning of repairs to locomotives very fully, which up to a few years ago played a great part in repairs to locomotives —up to that time our shops were filled with well organized staffs of skilled labor—but the problem that faces us to-day is somewhat different and the greatest problem to work out to enable us to take care of the repairs, which is the key to the success of the above planning, is to get the ideal foreman who can accomplish the work with a large percentage of unskilled labor to carry out the plans outlined in this paper, and the ideal formean is a product that can only be ripened by long years of experience, and it is true, as remarked by the previous speaker, that the ideal foreman is not knocking at the door for these positions; perhaps for no other reason than that the inducement offered usually does not make the welcome sufficiently attractive for them to aspire to these positions, as a man on the bench without any great responsibility, can command to-day easily as much or more money. We find that we are getting greater results by taking these things into consideration, and are devoting a good deal of our energy towards the best resources to develop the unskilled labor to keep the ranks of our shops filled up, and have recruits to fill the vacancies whenever our ranks are broken into through the volunteer or draft to the army that has to be supplied to support the cause of our nation, and to do this we have to select the man who knows and can handle the other fellow, including the engineer, fireman, machinist, boilermaker, laborer and cinderpit man by keeping them all working in step and harmony with one another. This is along the lines that we work, and have had very good results.

Mr. E. R. Battley:

What Mr. Gillespie says about the locomotive foreman bears out Mr. Winterrowd's statement in regard to supervision. We do not have many men with experience looking for these positions at the present time.

Mr. W. H. Winterrowd:

If I might make a suggestion—another point regarding the maintenance of power on the road and its repairs at the shop is the proper utilization of material and having the material on hand when required, and also the utilization and reclamation of materials that can be put to use in place of new ma-

terial. We have representatives from the Stores Department here to-night who could give us some valuable information.

Chairman:

Mr. McVeigh, they are all looking at you.

Mr. T. A. Summerskill:

In regard to locomotive foremen: I have had some difficulty in getting them, but the main trouble is to get enough to pay them. If you pay them what you pay your engineers you will be able to get good men for these positions.

Mr. E. J. McVeigh:

I do not think, Mr. President, that I am competent to discuss this locomotive business, but I have been on the road for a good many years and have been at the roundhouses and know a lot of roundhouse foremen. One of the best I ever knew told me that he considered the only plan on which to run a roundhouse was to run it the same as a fire station—always be ready for the unexpected, and expect it to happen. He was very successful, but that was some years ago and he was not up against the problems that confront the locomotive foreman to-day. I am sorry for a good many of them but am afraid I cannot help them very much.

Mr. J. W. Buckland:

Mr. Winterrowd spoke of material as being of paramount importance. I think we could keep more locomotives running if we had the material ready to ship out to the point required, and not wait until the locomotive foreman discovers that some casting has been broken and has to order it through the stores, taking ten days or two weeks to get it. Also we know from experience that spring gear and brake gear fail principally at certain seasons of the year, such as the spring time, and if we had the material for replacement ready to ship it would save considerable time in getting the engine back into service.

Mr. E. J. McVeigh:

With reference to that idea of co-operation between the different departments: That is another point where we are weak. We claim that we are not. The trouble is that when the mechanical department change a standard they throw out something that has been in use for years and call it obsolete, but they say nothing to the supply department until they want the article, and we then discover that they have been waiting

for it for the past two weeks. If we could have closer co-operation there is no question but that the railways would receive considerable benefit.

Chairman:

Mr. Winterrowd, you have had experience in designing locomotives and no doubt use different materials, which are made up to a standard design, such as inspirators, lubricators, etc. Why cannot these appliances be made so they will fit in on the locomotive?

Mr. W. H. Winterrowd:

I do not know the practice followed on other roads, but on the Canadian Pacific Railway when a locomotive is designed or re-designed, we always keep in mind the parts already in existence on other engines. The interchangeability of parts is a very important matter, and on the Canadian Pacific there are always a very large number of locomotives on which parts are interchangeable.

Regarding the standardization of small parts, would say that there have been some committees appointed by the Master Mechanics' Association who have considered these features, and they have made recommendations which have resulted in considerable progress. At the present time, we also interchange as far as possible material which is supplied by manufacturers.

Chairman:

What lead me to think of that was that at the M. C. B. Association standard couplers won approval in order to eliminate as far as possible the number of parts. Can we not do the same with other parts of the car or locomotive? Why should one injector be 22″ and another a different size? Why could we not make one 20″ as a standard for all? The same thing might be said of car draft gear. Why should the distance between the lugs be two inches on one type but different on others?

Mr. T. C. Hudson:

We have found that it is good practice and pays to standardize as far as possible the parts which enter into the maintenance of locomotives, such as injectors, grates, crossheads, etc. This is a considerable advantage, especially to the locomotive foreman, as he requires all our sympathy and help in this respect, so that he may be able to make repairs promptly

and keep the wheels turning, specially at this time when it is almost impossible to get new equipment. The stores, no doubt, do all that is possible, but in some cases material can not be secured, owing to the war conditions; and on this account we have had to take material from the scrap pile and use our ingenuity in making it into articles, which, before the war period, would not have been considered good practice.

Secretary:

I can agree with Mr. Winterrowd that in designing a locomotive it is well to put in as many standard parts as possible, but, of course, in the case of specialties, such as injectors and mountings, if you decide to adopt one make as standard another manufacturer comes along and points out the particular advantages of the appliance he has for sale, as against the one you are using and his appliance may be used. The result is that you get away from standards. I can however agree with Mr. Winterrowd that for the sake of economy the parts of the locomotive should be standardized as far as possible.

Chairman:

I did not refer to standard injectors. I referred to the standard dimensions of injectors, so you could put, say, a No. 7 of one type on the same locomotive.

A Member:

There is no reason why that cannot be done if you keep injectors of different capacity.

Chairman:

Mr. Battley, would you like to answer that question—or maybe we have a locomotive foreman here who would answer. Mr. McMillan?

Mr. E. S. McMillan:

I do not know that I can say very much about the locomotive foreman, but I believe that he is the one man who deserves our sympathy. Talking about getting a perfect locomotive foreman, I never yet ran across the man who pined for the job. We have come across little boys who wanted to be motor men or locomotive firemen, but I have not yet met the man who was anxious for the job of locomotive foreman.

Mr. T. C. Hudson:

The road foremen, the road engineers and the locomotive

foremen have many things in common in connection with their work, and they can accomplish a great deal by working together.

Mr. W. H. Winterrowd:

In connection with what has been said about the locomotive foreman. One of his handicaps to-day is the question of organization. I would like to know what Mr. Battley is doing and also what the Canadian Northern are doing in making fitters and machinists from unskilled labor. On the C. P. R. we are taking men who are unskilled and endeavoring to train them. We endeavor to specialize in assigning the work which these men have to do, which means that the closest supervision is necessary to obtain good results. The question of careful supervision and training is a vital one, and I would be very much interested to hear if any other roads are using any special methods in the training of their men.

Mr. W. H. Winterrowd:

I appreciate what you have said but I had in mind was the training of mechanics and other skilled workmen.

Mr. E. R. Battley:

When I spoke I had reference to the regular roundhouse mechanics. I did not makze reference to the foreman. The fellow in that position must possess a good many requirements. We have made successful locomotive foremen from apprentices, helpers, and also from engineers; in fact, from all trades.

Chairman (Mr. Hudson):

Is there any one else who wishes to discuss the paper? We have some roadmen here to-night, and I am sure the members would be pleased to hear from them; also, if there are any running shed or shop men who desire to take part in the discussion. Mr. Hunter is a railroad man of experience, we would like to hear from him.

Mr. W. C. Hunter:

During the discussion about the locomotive engineer, which has just taken place, I have been wondering what position he has been in during this time of stress. When the engineer takes an engine on the road he becomes a servant of the Transportation Department, and the Superintendent expects him to haul a certain number of cars on schedule, no matter what kind of an engine he has. It is obvious that with the con-

ditions we have gone through, and the lack of material and skilled labor, that the repairs to locomotives have increased and the engines have not been able to haul their full capacity, and I was just wondering how he was getting on and whether the Mechanical Department was backing him up. I would ask Mr. Battley what is his practice in regard to running repairs in roundhouses, and if special parts are kept on hand to make repairs to air pumps and injectors.

Mr. E. R. Battley:

We keep spare parts at roundhouses to repair the pumps and injectors. In the matter of boring cylinders; there are very few of our roundhouses equipped for boring cylinders. They have to do it on a lathe and it takes much longer that it would at the main shops. We keep spare parts for injectors, and only in extreme cases is it necessary to send them to the shop for repairs.

Mr. W. C. Hunter:

On the railway I was connected with it was the practice to keep spare pumps at the roundhouses, and if an engine came in with a pump giving trouble another pump was put on and the defective pump sent to the main shop for repairs, as at the main shop they could make the repairs cheaply and do much better work than at the roundhouse.

Mr. E. R. Battley:

At the majority of our roundhouses the light repairs to the pumps are taken care of at the roundhouse. If we sent each pump to the big shops for repairs it would require too many spare pumps.

Mr. W. J. Hatch:

Mr. Hunter has outlined a standard practice, but during periods of stress or severe conditions it is impossible to get material far enough in advance to carry that out. There is one question I would like to ask Mr. Battley (and I think he must be related to a certain air brake man I know of for writing such a paper) and that is—in one of his replies to Mr. Winterrowd he stated that in training men to be mechanics he put them with a trained shopman who coached them. I would like to know how he hypnotized the mechanic to tell the helper anything. I have never known a mechanic who would do it.

Mr. E. R. Battley:

I think I can explain that. At the present time mechanics are very scarce in our roundhouses and there is a certain amount of work that has to be done, and when you ask the mechanics. I did not make reference to the foreman. The he begins to consider that it is better to teach the other fellow than to work night and day himself.

Chairman (Mr. Hudson):

I think we have had a very nice discussion—Mr. Winterrowd?

Mr. W. H. Winterrowd:

There is just one more thing, Mr. Chairman, which may seem a small matter, but it is vital to the man in the engine-house, and that it whether or not the workmen at roundhouses are supplied with a proper quantity of small working tools. That is one of the most important things, as you cannot expect to get work out of a man unless you give him the right kind of tools.

Mr. E. R. Battley:

I agree with Mr. Winterrowd, but would like to know, how, after you have supplied these tools to the mechanics you are going to guarantee that they will keep them.

Secretary:

I have been requested to announce, in connection with new members, that any members now entering the Club will be carried from this May to the following May. Our rules provide for this after the first of February. This will be an argument for the members to use in obtaining further applications for membership in the Club.

Mr. R. M. Hannaford:

I wish to move a very hearty vote of thanks to Mr. Battley for his paper. I did not know anything about roundhouses when I came to the meeting, but I do know a little more now.

Mr. G. A. Kell:

I take pleasure in seconding that.

Chairman:

Moved by Mr. Hannaford, seconded by Mr. Kell, that a vote of thanks be tendered Mr. Battley for his paper.

Carried.

Mr. Battley, I have much pleasure, on behalf of the members, in thanking you for your paper. It has given us good instruction.

The Secretary wishes me to say that coffee and sandwiches are being served in the room at the rear. We would like you all to stay and partake of them.

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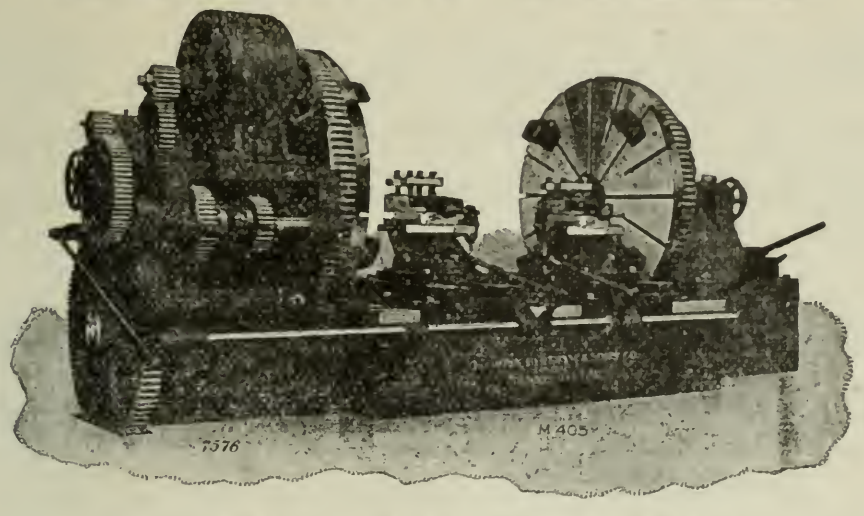

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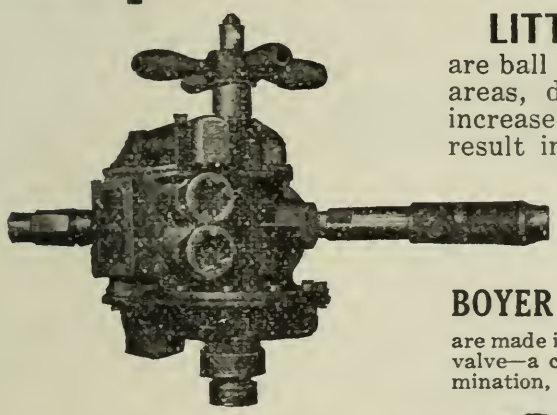

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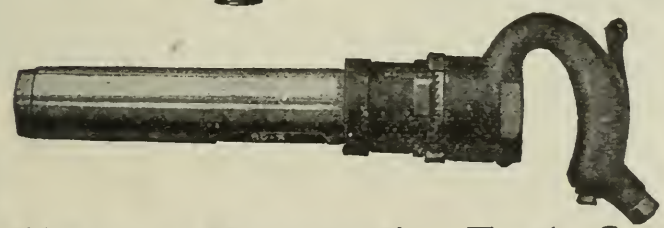

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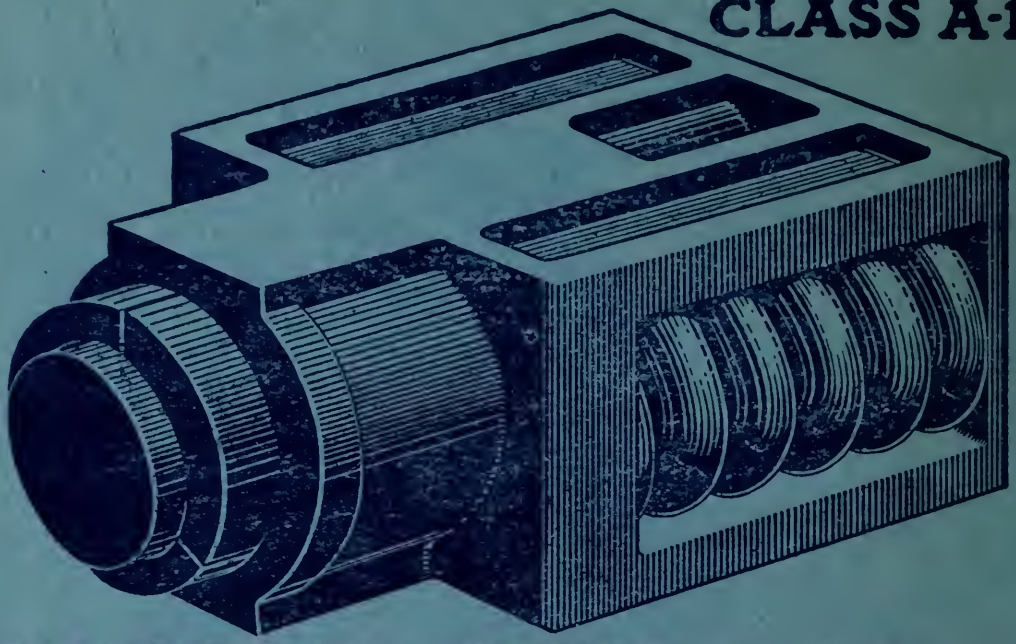

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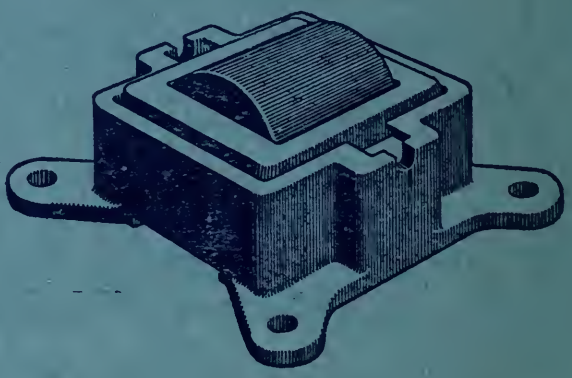

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